

# EUROPEAN POLICY ON LOCAL LOOP UNBUNDLING COMPETITION LAW BACKGROUND AND PROBLEMS OF IMPLEMENTATION

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## INTRODUCTION

One of the main aims of the "eEurope" initiative which was approved at the special European Council in Lisbon on 23 and 24 March 2000 was to promote cheaper Internet access by the means of introducing competition on the telecom incumbents local loop. While access in the form of interconnection was already a mandatory requirement under the existing regulatory framework, local loop unbundling had until then only been made mandatory in a few European countries like Germany, Denmark and Finland. To this end a key measure was the requirement for incumbents to offer access to their competitors on the last segment of telephone wire linking the network with the subscriber (what is called "local loop unbundling").<sup>2</sup>

Duplicating the local loops of the former network monopolies is, certainly in the short term, not economically viable for new entrants since it implies major new civil engineering works<sup>3</sup>. This is less true only with respect to certain large business customers, which are being connected on fibre optic rings rolled out by new entrants. Except in the few areas where cable TV networks are being upgraded to provide voice telephony and high-speed Internet access in addition to the provision of television programmes, the incumbent telephone operators remain de facto monopolies for the provision of the local loop to residential customers and small-to-medium-sized-enterprises (SMEs). The incumbent operators are extending their dominant position to the new emerging high speed services based on Digital Subscriber Line (DSL) technology. While incumbent operators have begun recently to offer ADSL broadband services to their own customers, access to the local loop for competitors wishing to offer similar services has in many cases been delayed or denied<sup>4</sup>. Obviously, incumbents are reluctant to facilitate the offering via their network, of services provided by new entrants which would compete with some of their own services.

The only means for new entrants to compete with incumbents to provide high-speed services to residential users and SMEs is to obtain access to the local loop, which requires incumbents to allow competitors to install their own equipment on both sides

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<sup>1</sup> The views expressed are those of the author and are not attributable to the Commission.

<sup>2</sup> The term "unbundling" is used because today such access is only provided via "interconnection" agreements which involve in addition to the access to the telephone wire also the acquisition of a service provided by the incumbent operator, the so-called "call termination".

<sup>3</sup> Estimates of the cost to replicate local loop infrastructure begin at €1000 per line, on average.

<sup>4</sup> New entrants have requested the relevant national competition authorities to delay the launch of the ADSL services of Telefonica, Telecom Italia, British Telecom and France Telecom until these undertakings provide some kind of unbundled access to their networks to allow for competing offers.

of the loop to provide their own services. Allowing competition on the local loop would put a strong downward pressure on tariffs for high-speed voice and data services and reduce substantially the cost of Internet access.

The paper is structured in the following way. The first part presents the arguments of the economists on the unbundling of local loop and in particular in relation with the political choice to apply mandatory ULL across the whole EU and with the pricing issue. The second part presents the European policy on local loop unbundling and the different official documents presented by the Commission, the Communication, the Recommendation and the Regulation. Finally, the third part is focussed on the implementation issue.

## **1. Economics of the Unbundling of Local Loop**

### ***1.1 The debate in Europe***

In a recent paper on "The Economics of Local Loop Unbundling" prepared for the European Commission as an independent expert paper (J.Gual and P.Seabright, May 2000), the authors discussed this issue from the economic point of view. For them competition in the local loop may become effective only if competitors are able to have access to existing networks rather than being obliged to build their own. However, the authors distinguish two basic economic issues: "The **first** is that, given the networks are in place, access to these networks should be available to the operator that would make most efficient use of them; we call this the **static** problem. The **second** issue is that investment in future networks should be encouraged by the promise of prices that enable a proper return, including a return to risk-taking. We call this the **dynamic** problem".

Moreover, the local loop unbundling also has to take into account the fact that rebalancing of tariffs has not been achieved in a large number of Member States. The main problem is that when incumbent operators price line rental below cost, then even efficient entrants who have access to the network at prices that correctly reflect resource costs may be unable profitably to offer customer services unless they have an equivalent source of funds for cross-subsidy.

In the conclusions of their paper, the authors present their view on the price at which local loop access should be made available to competitors of the incumbent which has constructed the network. For them "efficiency-based pricing guarantees that the infrastructure is used by the most efficient operators. Fixed costs are recovered in the most efficient way." The relevant cost of access is therefore an estimate of the long run marginal cost of access. LRIC (Long Range Incremental Cost) methodologies provide an approximation to these costs.

For the authors the main benefits from unbundling are likely to come not from more competitive provision of traditional voice telephony services but from provision of high-bandwidth services. Indeed, investment in new infrastructure is almost entirely for high-bandwidth purposes, since the existing copper pairs are already present in sufficient capacity in most places for the provision of traditional voice telephony.

Chris Doyle (2000) in a recent article "Local Loop Unbundling and Regulatory Risk" takes a different view. The author raises the point of the difficulties to get a clear economic evaluation of the benefits and costs to mandated ULL but recognises that "there does appear to be a case in its favour." He concludes that what are less certain are the appropriate pricing principles to apply to ULL, and the extent to which ULL should be mandated geographically. For Chris Doyle there appears to be no reason to support mandated ULL in densely populated urban areas, as competition among infrastructure providers is emerging. "While policy makers have championed ULL as a way to promote competition at the local level in telecommunications, applying mandated ULL across the whole of a country may be inappropriate and socially damaging."

An essential factor is the possibility for technological alternatives to compete with the local loop. Depending on the assumptions made, ULL will have to be mandated for a shorter or longer period of time. Chris Doyle therefore raises the issue of the difficulty for policy makers to decide on how long ULL should be made mandatory.

Finally, in a paper entitled "Competition in EC Telecommunications – Cross Subsidisation, Access and Predatory Pricing", P. Nicolaidis and R. Polmans (1999) underline that the setting of prices charged to competitors for access to the network is crucial in the emergence or not of effective competition. The general principal on pricing for access is "cost orientation" meaning that services have to be priced on a stand alone basis and in such a way that prices are in line with costs. However for the authors even if cost orientation appears to be reasonable, this principal suffers many weaknesses. The temptation for the incumbents will be to charge all costs and to exaggerate costs and charges. But, moreover and more importantly, cost orientation imposes a very heavy information burden on regulators. The existence of asymmetric information between regulators and incumbents is the main obstacle. For the authors, the problem of pricing could be solved by two possible remedies: structural or institutional.

"It would appear, therefore, that more drastic, structural and/or institutional solutions may have to be considered. The breaking up of the dominant incumbents would at minimum enable price and cost comparisons. Then there will be less need to adhere to pricing rules." Therefore for the authors if competition does not develop at a satisfactory pace, then the solution would not necessarily be to tighten pricing or costing rules but to consider more radical, probably structural, approaches to the problem of strengthening competition and preventing incumbent operators from abusing their dominance.

Without entering into an overly detailed discussion on the economics of unbundling, which the format of the present paper does not allow, we would like to emphasise an important dimension of the discussion on the economic rationale for local loop unbundling. Pure efficiency considerations may be biased, for several reasons. Efficiency based models suppose that efficiency can always be measured in terms of prices/costs and ignore quality considerations of the services and innovative aspects. There are clearly positive dynamic externalities of introducing competition in a previously monopolistic market. So, while efficiency considerations are certainly important in this discussion, they should be examined cautiously.

## 1.2 The debate in the US

Access to the local loop in the US is governed by the general network access principles of Section 251(d)(2), Telecommunications Act 1996.

*“In determining what network elements should be made available of this section, the Commission [Federal Communications Commission] shall consider, at a minimum, whether-*

*(A) access to such network elements as are proprietary in nature is **necessary**; and;*

*(B) the failure to provide access to such network elements would **impair** the ability of the telecommunications carrier seeking access to provide the services that it sees to offer.” [Bold highlights added.]*

The Federal Communications Commission (“FCC”) in its 1996 Local Competition First Report and Order<sup>5</sup> defined a “necessary” unbundling to be any technically feasible one.

Its interpretation of “impairment” was equally wide: there was a duty to unbundle where a telecommunications carrier seeking to offer a service would suffer the slightest impairment of its ability to do so.

The Court directed the FCC, to consider use of limiting principles in its test to determine when a network element should be subject to mandatory unbundling. The limiting principles were to be derived from other areas of anti-trust law and were to particularly include use of market power analysis and the essential facilities doctrine.

J. Hausman and J.G. Sidak in a recent article "A Consumer Welfare Approach to the Mandatory Unbundling of Telecommunications Networks" presented their answer to that request<sup>6</sup>. This paper proposes an interpretation of the Essential Facilities doctrine and Market Power analysis as a basis for US policy in relation to mandatory unbundling of telecommunications networks (including local loop).

It argues that the FCC should adopt a competition-based standard that exists when determining when there should be mandatory unbundling. In this way consumer welfare is accounted for, not least the value to the consumer of innovation and the introduction of new services.

The authors warn that there are negative implications of introducing a mandatory unbundling obligation, namely a reduced supply of alternative infrastructures and a reduced provision of new services. They suggest limiting the application of

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<sup>5</sup> First Report and Order, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, 11 F.C.C.R. 15,499(1996)

<sup>6</sup> Jerry Hausman, MacDonald Professor of Economics, Massachusetts Institute of Technology and

J. Gregory Sidak, FK Weyerhaeuser Fellow in Law and Economics, American Enterprise Institute for Public Policy Research.

mandatory unbundling to situations where sunk costs are high, limiting ex ante regulation only to when it is really required.

For the authors unbundling of a network element should be mandatory if, and only if a certain number of conditions are fulfilled. In particular:

- (1) it is technically feasible to provide to the network services purchaser unbundled access to the relevant network in the relevant geographic market;
- (2) it is impractical and unreasonable for the network services purchaser to duplicate the network element through any alternative source of supply;
- (3) the network is controlled by a network services supplier that is a monopolist in the supply of a telecommunications service to end users for the relevant geographic market; and
- (4) the network services supplier can exercise market power in the provision of telecommunications services to end users in the relevant geographic market by restricting access to the network.

Where there is a proprietary network element based on Intellectual Property, the standard should provide for unbundling only where competition will be impossible in the absence of unbundling.

However, the first results of the American experience should limit our enthusiasm on the intrinsic virtues of ULL in creating a true competitive environment, and calls for additional attention being given to the conditions of unbundling. New entrants have succeeded in capturing roughly 25% of the US market of DSL services<sup>7</sup>. However this result is fragile and could be jeopardised in the near future. One of the two main players, NorthPoint, in early 2001 for bankruptcy. The situation of COVAD, the other important player on the US market is also fragile : the company will remain unable to post profits in the near future and the price of its shares recently dropped from US 70 to US 3.5 dollars, reflecting the market's increasing doubts on its long term viability and ability to seriously challenge the incumbents' position.

These very fragile results after four years of ULL in the United States call for caution and increased attention being given not to the issue of access per se, for which we now have an EC Regulation, but to the conditions of access.

## **2. European Policy on local loop unbundling**

### **2.1. The Communication**

In April 2000, the Commission issued a communication on local loop unbundling entitled "Unbundled Access to the Local Loop : Enabling the competitive provision of a full range of electronic communication services including broadband multimedia

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<sup>7</sup> Source : IDATE, « 2000 the year of DSL's first steps », available on [www.idate.fr](http://www.idate.fr)

and high speed Internet”<sup>8</sup>. In this Communication, the Commission examined the incentive effects of local loop unbundling on increased competition and economic efficiency. The argument presented there was that local loop unbundling can encourage the development of a more competitive market for voice telephony and high-speed services by allowing new entrants to upgrade the incumbents local loops and to offer directly themselves broadband services to users. The Communication therefore establishes "the framework for any mandated access to local loops of incumbents, and accompanying pricing controls, against a standard of promoting economic efficiency, enabling wider competition and maximising consumer and user welfare."

Even if the incumbents 'local loop access' is not the only technical infrastructure enabling the provision of retail services to end-users, since other alternatives exist such as upgraded cable TV networks, wireless local loop or fibre optic networks, none of these technological alternatives are considered as equivalent at least at present. The incumbents' local loop network is presently developed nation-wide in all the Member States. Therefore, the bottleneck situation in the provision of access to local network does not impede new entrants from developing local networks in densely urban cities but they will not be able to compete nation-wide since for local calls, the incumbents market share is well above 90% in nearly all the Member States. Moreover, given the investment required to carry out a nation-wide duplication of the incumbents' local network, the barriers to entry for any competitor are too high. The refusal of incumbents to give access to new entrants on their local loop would therefore in the short to medium term eliminate the possibility for them to compete on the nation-wide market for local calls. The Communication sets out the application of the competition rules, in particular Article 82, to the refusal of access to the local loop and other forms of possible abuse of dominant position.

- I. Refusal to deal: under a certain set of conditions, denial of access to the local loop may constitute a violation of Article 82, namely if :
  - No objective reasons to refuse access
  - Sufficient capacity available
  - Requesting party ready to pay a non-discriminatory price
  - Refusal of access to limit emergence of new services.
- II. Discrimination where the incumbent is already providing local loop access to at least one operator.
- III. Limitation of production, markets or technical development to the prejudice of consumers.

The Communication then presents the dominant operators' duties regarding the conditions of access and pricing. Finally, the Communication also presents the application of sector-specific rules, namely the Open Network Provision directives concerning the harmonisation of conditions for open and efficient access to public telecommunications network.

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<sup>8</sup> JO C272 du 23.9.2000.

## **2.2 The Recommendation:**

In a first step, the Commission decided to go for a « soft law » approach with a Recommendation<sup>9</sup> to the Member States, which was adopted in May 2000. This Recommendation is now clearly outdated (see below). It however clarified the kind of standards which incumbents should follow in their unbundling offers. The main items which should be included in their reference offers were spelled out in an Annex to the Recommendation and have been maintained in the Regulation approved since then.

## **2.3 The Regulation**

In order to avoid the risk that unbundling of the local loop would not be available universally within the deadline fixed by the recommendation/communication of 24 April 2000, the Commission subsequently adopted on Regulation mandating local loop unbundling<sup>10</sup>. Regulators had indeed requested “hard law” in order to avoid challenges by incumbents of their decisions mandating ULL to national Courts. The Regulation was promptly adopted with the new 'Amsterdam' procedure, allowing for adoption of directives in one single reading. Moreover, a 'regulation' could be used directly as legal instrument, not requiring further implementation measures by Member States.

The Regulation mandates unbundled access to the metallic local loops of network operators that have been designated by their national regulatory authorities as having significant market power (SMP) in the fixed public telephone network supply market under the relevant Community provisions. The Regulation also presents the approach to be adopted for the costing and pricing rules.

Costing and pricing rules for local loops and related facilities should be transparent, non-discriminatory and objective. Pricing rules should ensure that the local loop provider is able to cover its appropriate costs in this regard plus a reasonable return. Pricing rules for local loops should foster fair and sustainable competition and ensure that there is no distortion of competition, in particular no margin squeeze between prices of wholesale and retail services of the notified operator. The offer should be sufficiently unbundled so that the beneficiary does not have to pay for network elements or facilities which are not necessary for the supply of its services, and must contain a description of the component offerings, associated terms and conditions, including charges.

Although commercial negotiation is the preferred method for reaching agreement on technical and pricing issues for local loop access, experience shows that in most cases regulatory intervention is necessary due to imbalance in negotiating power between the new entrant and the notified operator, and lack of other alternatives. In certain circumstances the national telecommunications regulatory authority may, in

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<sup>9</sup> OJ L156 23 June 2000.

<sup>10</sup> OJ L336 30 December 2000.

accordance with Community law, intervene at its own initiative in order to ensure fair competition, economic efficiency and maximum benefit for end-users.

### **3. Problems of implementation of ULL in Europe <sup>11</sup>:**

Unbundling cannot take place overnight. Preparatory works in the exchanges of the incumbents require a couple of months, procedures of access and contractual arrangements between incumbents and new entrants need to be agreed, and prices to be approved by the regulators.

#### **3.1 General Overview**

The situation in the various EU member states varies considerably with regard to ULL. In a first group of countries, ULL was already mandatory and effective under national legislation before the EC Regulation came into force on 2.1.2001. These countries include Finland (1996), Denmark (1998), Germany (1998), Austria (1998), Sweden (2000) and the Netherlands (2000). However, even among this first group of countries the situation is far from being homogeneous. In Austria where the legislation was already passed in 1998 like in Germany, unbundling has proved to be much slower than in Germany and, by mid-2000, only very few lines had been unbundled. By the end of 2000 ULL had only been implemented nation-wide on a large scale in Denmark, Finland and Germany.

In a second group of countries national legislation was adopted recently, in 1999 or 2000: in these countries ULL has been prepared at national level through consultations and trials, and will actually start in 2001. These countries include Italy (where the trial period in theory already ended by end October 2000), France, the UK, Belgium and Spain. They therefore seem to be basically ready to implement the EU Regulation, although the pace of implementation might differ from one country to another: in the UK ULL had initially been envisaged to come into force only on 1 July 2001 and may encounter delays in the course of the first semester 2001. In France the regulator announced in February 2001 its changes to the initial offer of France Telecom. All this means that unbundling shall in those countries basically start in the course or by the end of the first semester of 2001.

A third group of Member States have not adopted any national legislation pertaining to ULL: Luxembourg, Ireland, Greece, Portugal. While the EC Regulation obviously applies equally to the latter countries as of 2.1.2001, given the amount of preparatory work necessary this in practice means that ULL implementation might be delayed until the second semester 2001 or even later on.

The new Regulation, even once fully implemented, will not solve all the problems which ULL may raise: indeed, incumbents have many ways to make life difficult for new entrants challenging their traditional monopolistic situation on the local loop. This is the famous 3D strategy: Deny, Defer, Deter. Once pure denial is clearly made

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<sup>11</sup> That part has been prepared by Christophe Pavret de la Rochefordière who is in charge of the sector Inquiry on ULL in the Directorate General for Competition.

impossible by the virtue of competition law or regulation, quite a series of means remain available for incumbents to dissuade entry on the market. They relate to the conditions of unbundling, and show that the devil is in the detail.

It is worth noting that some new operators are already pulling out of local loop activities. One of the main pan-European new entrants, KPNQwest, announced in late 2000 that it was cancelling its operations in this area. The number of operators initially interested in unbundling trials in France and the UK in 2000 have now, by early 2001, dropped considerably. Like in the US, the early enthusiasm of the late nineties has now faded away and been replaced by growing scepticism. This is certainly not a reason for the Commission or national authorities to reconsider ULL requirements, but demonstrates how difficult the process of ULL may and probably will be. It calls for a strong monitoring of the situation both at national and at Community level.

### **3.2 The pricing issue**

Pricing is a first crucial condition of access, and a potential source of abuse. While it is not disputed that access to the local loop should be provided at a reasonable price, the issue here is what a “reasonable” price means. One of the key issues in a country like Germany is the price structure: while Deutsche Telekom’s retail access tariffs have not been rebalanced, which means that retail access to end-users is apparently provided below real cost, access prices to the local loop have been set according to cost orientation principles, which is in principle in line with Community policies guidelines and what is now foreseen in the new Regulation. The result is a distorted price structure between the upstream access and downstream retail markets. In countries like the UK or Ireland where retail prices do not seem to have been fully rebalanced yet the scope for price squeezes between the incumbents upstream and downstream services is also significant.

The regulators’ role with respect to pricing is crucial: while RegTP, the German regulator, reduced the access price initially requested by Deutsche Telekom, it apparently did not consider DT’s price structure as a whole. In a recent decision, the French Authority, ART, rejected France Telecom’s claim of access price and substantially reduced it. However it is worth noting that the French regulator incorporated in its decision non-cost based considerations on the shared access price which may raise further questions on the appropriateness of this price imposed on France Telecom.

A comprehensive overview of monthly line rental access charges is difficult at this early stage. First indications show an average line rental price close to 13 € (monthly), with a few countries on the higher side of the spectrum (UK, Ireland, Luxembourg), and a few other ones where access monthly charges are relatively cheaper (Sweden, Denmark). At the time of writing this paper shared access prices were available only in a minority of Member States.

### **3.3 The collocation issue**

Another common cause of dispute on unbundling is collocation, i.e. the space made available by incumbents in their own exchanges for the new entrant's transmission and connection equipment. In several cases, American incumbents claimed that there was not enough space available for new entrants. The FCC has demonstrated a tough hands-on monitoring of this issue and ordered inspections. In some cases it appeared that the old electro-mechanical switching equipment had not been removed from the exchanges, and that the new entrants' digital equipment –which is much more compact- could thus not be installed. The FCC ordered the removal of the old equipment in order to create collocation space. Procedures of collocation –typically first in, first served- can turn out to be a nightmare, creating a potentially significant barrier of entry to late comers who would have to locate their equipment outside the exchange and pay extra costs for this. In the UK, a complex procedure regarding collocation foreseen in the trial period was recently cancelled given the low number of new entrants which expressed an interest in unbundled access, thus reducing the scope for scarcity of collocation space in the initial phase. As with regard to prices, the new EC regulation is very much on the shoulders of regulators, who have to approve and monitor collocation conditions. However, abuses may also be investigated on the basis of EC competition rules: unmotivated refusals of collocation may amount to refusals to deal, and/or to discrimination.

### **3.4 Delays**

Delays are a crucial issue. Delaying tactics from incumbents may completely disorganise the new entrants' operations and planning as they need to roll out their own upstream fibre network down to the incumbents' points of presence. Worse, it may destroy consumer confidence in their ability to deliver services in a competitive way. In a world of scarce finance and increasing mistrust vis-à-vis e-companies, this delays profitability, has a high financial cost, and may end-up in undermining the new entrants shareholders' confidence as well.

### **3.5 The Sector Inquiry**

In order to monitor closely the situation, the Commission launched in July 2000 a sector enquiry on the basis of the competition rules. This sector enquiry will take a while, because while the Regulation is now being progressively implemented in all Member States, the situation on the market changes nearly every week. We believe that the aim of the sector enquiry, in this particular context, is not to provide us with a static photography of the situation, but rather to be used as a dynamic monitoring instrument. Because ULL is so important, a close hands-on monitoring of the situation from both angles, regulation and competition rules is clearly needed.

## **Conclusions**

Finally, three general remarks on the unbundling of the local loop: firstly on the importance of rebalancing of tariff, secondly on the complementary role of competition law and regulation and finally on the complexity of the process of ULL. Firstly, the rebalancing of tariffs across the EU is not only a binding obligation for the Member States according to the cost orientation principles of the Directives but it is a key element for the development of the unbundling of local loop and therefore for the eEurope initiative. The remaining of tariff unbalances may have at least two negative effects. It may impede the emergence of a genuine competition in the local loop by leading to situation of price squeeze as line rental tariff remains lower than cost which would make the local loop unbundling very difficult. Moreover, the tariff unbalances gives a wrong signal to new entrants inducing them to concentrate on segments where call tariffs are kept artificially high by incumbents in order to compensate for access deficit. Therefore phasing out the access deficit is a precondition to set the tariffs for access to the ULL. This is the reason why the Commission has launched infringement proceedings regarding Germany, Italy, Spain and France.

Secondly, some confusion seems to have arisen as a result of the entry into force of the Regulation on the 2<sup>nd</sup> January 2001, as to whether competition proceedings may still be opened. Does competition law apply? The answer is clearly yes, without any ambiguity. The Commission has repeatedly stated that competition rules apply in the sector of telecommunications irrespective and independently from sector specific regulation. Competition proceedings for abuses of dominant position, for instance in the case of unfair conditions of access to the local loop, may be opened. The parallelism of competition law and regulation should not be seen as contradictory: on the contrary, we very much see them as complementary. Price distortions are a good example of this complementary. They can be addressed both with the Regulation, which requires cost oriented access prices, or through traditional price abuses under article 82 of the treaty, for instance in the case of price squeeze situations.

Thirdly, unbundling is a remedy to the absence of competition on the local loop. Like many behavioural remedies, it implies a complex monitoring – a large part of which has in the EU been deferred to Regulation Authorities- and triggers many possible disputes, not on the nature of the remedy itself, but on its precise modalities: unbundling yes, but at which price, with which delay, which support services etc.... The splitting of the incumbent's retail services on the local loop from their infrastructure services would reduce the scope for cross-subsidisation which is often taking place through internal –artificial- transfer prices, limit price distortions, and introduce the necessary transparency giving evidence where an incumbent discriminates its competitors with its own downstream activities.

## ANNEX

### Indicative list of items to be included a Reference Offer<sup>12</sup> for Unbundled Access to the local loop to be published by notified operators

#### *A. Conditions for unbundled access to the local loop*

##### 1. Network elements to which access is offered :

covering in particular the following elements

- access to raw copper local loops (copper terminating at the local switch) and subloops (copper terminating at the remote concentrator or equivalent facility), in the case of full unbundling
  - access to non-voice frequencies of a local loop, in the case of shared access to the local loop;
  - access to space within a main distribution frame (MDF) site of the notified operator for attachment of DSL access multiplexors (DSLAMs) and similar types of equipment to the local loop of the notified operator.
2. **Availability : all relevant detail regarding local network architecture, information** concerning the locations of physical access sites, availability of copper pairs in specific parts of the access network;
3. **Technical conditions:** technical characteristics of copper pairs in the local loop; lengths, wire diameters, loading coils and bridged taps; line testing and conditioning procedures. Specifications for DSL equipment, splitters etc, with reference to relevant international standards or recommendations; spectrum limitations and electromagnetic compatibility requirements designed to prevent interference with other systems;
4. **Provisioning procedures:** line investigations for specific DSL technologies, ordering and provisioning procedures, usage restrictions,

#### *B. Collocation services*

5. **Information on collocation sites:** in particular the precise locations<sup>13</sup> of the notified operator's relevant sites; including switches, Main Distribution Frame (MDF), concentrators, and remote distribution points such as street cabinets, pedestals and vaults. Specification of the Web site(s) where the updated list of locations is published. Availability of alternatives when physical collocation is not available.
6. **Collocation Options at the sites identified under 5) above:** the types of collocation available (*e.g.*, shared, caged/cageless, physical, or virtual); availability of power and air-conditioning facilities at these sites; rules for subleasing of collocation space.
7. **Equipment** characteristics: restrictions, if any, on equipment that can be collocated.

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<sup>12</sup> A reference offer for unbundled local loop access includes the basic set of technical facilities, including terms and conditions, and prices, offered to market players.

<sup>13</sup> Availability of this information may be restricted to only interested parties to avoid concerns on public security.

8. **Security Issues.** measures put in place by notified operators to ensure the security of their locations; conditions for access by the staff of competitive operators in order to identify and repair service problems.
9. **Safety Standards :** (In principle safety standards used by the incumbent and its affiliates should be deemed adequate for competitive operators' equipment).
10. **Inspections :** conditions for competitive operators and NRAs to inspect the locations at which physical collocation is available, or sites where collocation has been refused on grounds of lack of capacity.

**C. *Operational Support systems***

11. Conditions for access to the notified operator's operational support systems, information systems or databases for pre-ordering, provisioning, ordering, maintenance and repair requests and billing.
12. In principle the operational support system (OSS) elements listed should cover access to all loop qualification information, including information on whether a particular loop is capable of supporting advanced services.

**D. *Supply conditions***

13. **Timeframes:** lead time for responding to requests for supply of services and facilities, as well as contractual compensation provided in case of failure to meet those time frames, service level agreements, fault resolution and escalation procedures.
14. **Prices** for each feature, function and facility listed above, shown separately, including one time payments and recurring rental payments.